مركز المستشار الوطني للتدريب
National Consultant Centre For Training
YOUR GATE TO HANDS-ON TRAINING

5-Day Cement Industry Training Course
In

CEMENT GRINDING SYSTEMS (SITE VISIT)

Cairo - Egypt, 08 – 12 June 2026

COURSE LEVEL: INTERMEDIATE TO ADVANCED

COURSE OVERVIEW:

The complexity of modern cement grinding systems requires a deep understanding of the mechanical and process interactions between various pieces of equipment. This course defines the configuration of advanced grinding circuits, including ball mills combined with roller presses and vertical roller mills. By examining the system as a whole, participants will learn how to synchronize feeding, grinding, separation, and transport to achieve maximum operational stability.

The scope of this training extends beyond the mill itself to include the entire material handling and air circuit associated with grinding. It covers the operation of high-efficiency separators, dust collection systems, and cement coolers. The course also addresses the technical requirements for producing diverse cement grades and the logistical challenges of transitioning between different products within the same grinding system.

Coverage includes the practical application of process control strategies and the physical inspection of grinding components. Through a detailed site visit, participants will have the opportunity to walk through a functioning grinding department, observing the startup sequences and the monitoring of critical parameters from the control room. Attendees will gain a practical perspective on how maintenance and process teams collaborate to ensure the reliability and efficiency of the grinding systems.

COURSE OBJECTIVES:

After completion of this course, the participants will be able to:

- Compare the performance of different grinding system configurations.
- Describe the material flow and air circuits in a closed-loop grinding system.
- Analyze the role of the roller press as a pre-grinder to increase capacity.
- Evaluate the efficiency of high-efficiency separators in real-world conditions.
- Monitor the pressure drops and temperatures across the grinding circuit.
- Manage the operation of large bag filters and dust extraction units.
- Implement effective start-up and shut-down procedures for the grinding plant.
- Coordinate the logistics of cement storage and transport to silos.
- Identify mechanical wear and tear in ducting, liners, and chutes.
- Use process data to identify bottlenecks within the grinding system.
- Maintain the integrity of the air seals to prevent false air ingress.
- Prepare a comprehensive operational report on system performance.

TARGET AUDIENCE:

This course is intended for Process Engineers, Maintenance Managers, Production Supervisors, and Control Room Operators who manage the finishing department of a cement plant.

TRAINING COURSE METHODOLOGY:

A highly interactive combination of lectures, discussion sessions, and case studies will be employed to maximize the transfer of information, knowledge, and experience. The course will be intensive, practical, and highly interactive. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. The attendants will also be encouraged to raise more of their questions and to share in developing the right answers using their analysis and experience. There will also be some indoor experiential activities to enhance the learning experience. Course material will be provided in PowerPoint, with necessary animations, learning videos, and general discussions.

The course participants shall be evaluated before, during, and at the end of the course.

COURSE CERTIFICATE:

National Consultant Centre for Training LLC (NCC) will issue an Attendance Certificate to all participants completing a minimum of 80% of the total attendance time requirement.

COURSE OUTLINE / COURSE CONTENT:

MODULE 1: TYPES OF GRINDING SYSTEMS

- Ball mill only: open and closed circuit configurations.
- Combined systems: Roller press with ball mill (Pre-grinding).
- Vertical Roller Mill (VRM) for cement grinding.
- Comparative energy efficiency and product quality.
- Selection criteria for new grinding installations.

MODULE 2: ROLLER PRESS TECHNOLOGY

- Operating principles of high-pressure grinding rolls (HPGR).
- Impact of "micro-cracking" on clinker grindability.
- Mechanical design: rollers, hydraulic systems, and drives.
- Managing the "bypass" and "recirculation" in the roller press.
- Wear protection and hard-facing of roller surfaces.

MODULE 3: MATERIAL FEEDING AND DOSING

- Weigh feeders and their calibration for precision dosing.
- Managing multi-component feeds: clinker, gypsum, and SCMs.
- Preventing material segregation in the feed bins.
- Handling moist materials in the grinding circuit.
- Automation of the feed control loop.

MODULE 4: SEPARATOR AND CYCLONE OPERATIONS

- Integration of the V-Separator with the roller press.
- Operation of the third-generation high-efficiency classifier.
- Balancing the air flow between the mill and the separator.
- Impact of the separator circulating factor on system power.
- Troubleshooting poor separation and "coarse tails."

MODULE 5: THE AIR CIRCUIT AND DUST COLLECTION

- Design of the mill fan and its control via VFD.
- Managing gas velocities in ducts to prevent material settling.
- Operation and maintenance of pulse-jet bag filters.
- Monitoring emissions and ensuring compliance with local laws.
- Dealing with condensation and "mudding" in dust collectors.

MODULE 6: CEMENT TRANSPORT AND STORAGE

- Pneumatic conveying: air slides and screw pumps.
- Mechanical conveying: bucket elevators and belt conveyors.
- Silo management: preventing "ratholing" and material hang-up.
- Operation of aeration systems for smooth silo discharge.
- Protecting cement quality during long-term storage.

MODULE 7: SYSTEM INSTRUMENTATION AND SENSORS

- Accurate measurement of mill fill level (folaphone/ear).
- Temperature and pressure sensors across the circuit.
- Flow meters for water and grinding aid dosing.
- Online particle size analyzers (PSA) and their calibration.
- Interpreting trends and alarms on the DCS interface.

MODULE 8: LUBRICATION AND COOLING SYSTEMS

- Centralized lubrication for the mill trunnions and girth gear.
- Cooling water circuits for the mill shell and bearings.
- Oil lubrication units for large gearboxes and fans.
- Oil analysis as a tool for predictive maintenance.
- Troubleshooting lubrication failures and leaks.

MODULE 9: OPERATIONAL OPTIMIZATION STRATEGIES

- Tuning the PID loops for stable mill operation.
- Strategies for maximizing throughput during peak hours.
- Managing the transition between different cement types.
- Reducing the "blind time" during product changes.
- Case studies in solving grinding system bottlenecks.

MODULE 10: SAFETY IN THE GRINDING DEPARTMENT

- Hazards of rotating machinery and high-pressure hydraulics.
- Confined space entry procedures for mill and separator.

- Safe handling of chemical grinding aids.
- Working at heights on the elevator and silos.
- Noise and vibration protection for operators.

MODULE 11: SITE VISIT: SYSTEM WALKTHROUGH

- Detailed inspection of the roller press and ball mill.
- Observing the separator and bag filter operation.
- Review of the packing plant and silo discharge area.
- Q and A session with the shift supervisor in the control room.
- Practical demonstration of mill internal inspection (if available).

MODULE 12: COURSE CONCLUSION AND FINAL REVIEW

- Summary of system interactions and optimization.
- Final quiz and evaluation of participant knowledge.
- Discussion on future trends: Digitalization of grinding.
- Closing remarks and feedback.